

CLAIMS

1. A system for synchronizing and serving multimedia content in a distributed network environment the system comprising:

a synchronization server;

a content server; and

a plurality of clients, wherein the synchronization server provides a indication of an update to a multimedia resource to the clients, and the content server provides content information to the clients based upon the indication provided by the synchronization server.

2. The system of claim 1, wherein the indication includes location information for an updated multimedia resource.

3. The system of claim 1, wherein the synchronization server is a multitasking system that executes a plurality of processes, each of the plurality of processes capable of processing distributed events generated by each of the clients and synchronizing the distributed events.

4. The system of claim 3, wherein the distributed events update a shared resource, and the distributed events are processed by the synchronization server in the order received by the synchronization server.

5. The system of claim 1, wherein the content information is static.

6. The system of claim 5, wherein the synchronization server includes a shared resource, and wherein the shared resource is updated by one of the plurality of clients in real time.

7. The system of claim 1, wherein the content information changes in real time.

8. A method for synchronizing and serving multimedia content in a distributed network, the method comprising the following steps:

maintaining current state synchronization information for the multimedia content on a synchronization server;

modifying, on one of a plurality of clients, the multimedia content by providing modification information and location information for the multimedia content; updating the multimedia content according to the modification information; and producing updated multimedia content and updated location information.

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9. The method of claim 8, further including the step of communicating update location information to the plurality of clients, wherein the update location information includes the location of the updated multimedia content.

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10. A system for representing a computer-based course, the system comprising: a database server having an object database; a course editor for editing a plurality of courses and organizing a plurality of multimedia resources into one of the plurality of courses; and a multimedia content server for storing the plurality of multimedia resources, wherein the course editor enters resource information for each of the plurality of multimedia resources into the object database, and wherein the course editor produces identification information for each of the plurality of courses for entry into the object database.

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11. The system of claim 10, further comprising: at least one client which executes a query of the database server to determine available course information, wherein the available course information is a list of the plurality of courses.

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12. The system of claim 11, wherein the client executes a query on the database server to determine a location for the desired course based on a selection of a desired course from the plurality of available courses.

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13. The system of claim 11, wherein the database server creates a registration record for a user of the client upon a selection of a desired course from the plurality of available courses.

14. The system of claim 13, in the multimedia content server creates a structured document for the user, the structure document including a link for courses having a registration record for the user.

5 15. The system of claim 14, wherein the user selects a link corresponding to a course to begin instruction of a course.

16. A method for representing a computer-based course, the method comprising the following steps:

10 creating, through a course editor, a computer-based course including a plurality of multimedia references;

entering resource information for each of the plurality of multimedia references in an object database;

producing identification information for each of the multimedia references; and

15 entering the identification information into the object database.

17. A method for conducting a computer-based course in a multimedia system method comprising the following steps:

20 executing a query to determine available course information concerning a plurality of available courses;

selecting a desired course from the plurality of available courses;

executing, based on a selection of the desired course, a query to determine a location for the desired course.

25 18. The method of claim 17, further comprising the step of obtaining course content information based upon the location of the desired course.

19. A method for conducting a computer-based course in a multimedia system, the method comprising the following steps:

30 executing a query to determine at least one multimedia reference associated with a desired course;

selecting a desired multimedia reference associated with the desired course;

providing, based on a selection of the desired multimedia reference, a location of the desired multimedia resource.

20. The method of claim 19, further comprising the step of obtaining the multimedia resource based upon the location of the desired multimedia reference.

21. The method of claim 17, wherein the step of executing a query is performed through a plurality of distributed objects, wherein a first distributed object forwards the query to a second distributed object, the distributed object executing the query and providing a response to the first distributed object.

22. The method of claim 19, wherein the step of executing a query is performed through a plurality of distributed objects, wherein a first distributed object forwards the query to a second distributed object, the distributed object executing the query and providing a response to the first distributed object.

23. A method for serving multimedia content in a distributed network, the network including a synchronization server that maintains synchronization of distributed object-oriented software objects with at least one client, the method comprising steps of:
maintaining, by the synchronization server, a first object-oriented software object;
creating, on the client, a second first object-oriented software object and
synchronizing the second object to the first object;
maintaining, by the synchronization server, a list of one or more clients that have one or more objects that are synchronized to the first object; and
sending an update event to the one or more clients on the list.

24. The method according to claim 23, wherein the first object is located at the synchronization server.

25. The method according to claim 23, wherein the first and second objects are room objects.

26. The method according to claim 23, wherein the step of sending includes sending an update event only to clients on the list.

27. The method according to claim 23, wherein the update event includes location information of an updated multimedia resource.

28. A computer-implemented virtual course system adapted to a distributed network environment, the course system comprising:

a content server providing course-related information;

a plurality of clients adapted to exchange information with the content server; and

a synchronization server;

wherein the synchronization server provides an indication of an update to the course-related information to the clients, upon which at least one client sends a request for updated course-related information to the content server and the content server provides the updated course-related information to the at least one client in response to the request.

29. The computer-implemented virtual course system of claim 28, wherein the course-related information comprises at least information on a virtual whiteboard.

30. The computer-implemented virtual course system of claim 29, wherein the course-related information further comprises at least one of the following: a course catalog, and course instructional materials.

31. A computer-implemented virtual course system adapted to a distributed network environment, the course system comprising:

a plurality of clients located on a plurality of computers in the distributed network environment;

means for providing course-related information to the plurality of clients;

means for synchronizing the course-related information across the clients after an update to the course-related information by a first client, wherein the means for synchronizing further comprise means for sending an update event to at least one client in response to the update to the course-related information by the first client and means for

retrieving updated course-related information, by the at least one client, in response to the update event.

32. The computer-implemented course system of claim 31, further comprising means for providing at least a portion of the course-related information to at least two clients from the plurality of clients subscribed to receive the portion of the course-related information, wherein the portion of the course-related information is not shared with clients that are not subscribed to receive the course-related information.

33. A method for providing course-related information to a plurality of clients in a distributed network environment, the method comprising:

providing, by a content server, the course-related information to the plurality of clients;

updating, by a first client, the course-related information;

sending an update event, by a synchronization server, to at least one client from the plurality of clients;

sending a request, by the at least one client, to the content server for updated course-related information in response to the update from the synchronization server; and

providing, by the content server, the updated course-related information to the at least one client from the plurality of clients in response to receiving the request for the updated information from the at least one client.